CRUSTAL MOTION AND GLOBAL GEODETIC OBSERVABLES FROM ANTARCTIC ICE MASS CHANGES

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Glaciological estimates of the present-day ice mass balance of Antarctica vary widely, with recent studies finding both positive mass balance (up to 1.1 mm/a equivalent sea-level fall [*Bentley and Giovinetto*, 1991]) and negative mass balance (up to 1.3 mm/a equivalent sea-level rise [*Jacobs et al*., 1992]). The elastic crustal response to 4 realistic, but contrasting, scenarios of present-day Antarctic ice mass change constructed from these studies shows peak vertical rates less than 10 mm/a, and with one exception, less than 5 mm/a. In comparison, the ICE-3G glacial rebound model of *Tushingham and Peltier* [1991], which features substantial ice mass loss (equivalent to ~25 m sea-level rise) between 9 ka and 4 ka, yields peak rates in excess of 20 mm/a. This suggests that observations of present-day crustal motion in Antarctica, such as could be obtained from a future GPS survey, could assist in placing constraints on the timing and magnitude of deglaciation. In contrast to the rather small crustal velocities found for most of the present-day scenarios, the predicted secular variation in the zonal harmonics ($\dot{J}_l$) and drift of the Earth's rotation axis are found to be substantial fractions of the observed rates, in agreement with earlier studies. Present-day ice mass changes must be included when constructing budgets for these global geodetic observables.

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3. H.-P. Plag and S. M. Kloskó

4. 2 overhead projectors preferred

5. prefer oral presentation

6. no award applied for.